بسم الله الرحمن الرحيم

عنوان المحاضرة: Testicular Tumors
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Classification of Testicular Tumors

Primary		Secondary
Germ Cell tumors	**Non-germ cell tumors**	
1-Seminoma 2-Non-seminomatous germ cell tumors (NSGCT) -Empryonal carcinoma -Teratoma -Yolk sac tumors -Choriocarcinoma 3-Mixed cell tumors	Leydig cell tumors Sertoli cell tumors Gonadoblastoma Lymphoma	Prostate tumors Lung tumors

Germ cell tumors:

Epidemiology:

Incidence: The average annual incidence rate for American men 2-3 per 100,000.

Age: -The most common solid tumors in adults between 20 and 35-year

-Peak incidences of testicular tumors occur in late adolescence to early adulthood (20 to 40 years).

-Occurs less: -In infancy & childhood: 0-10 years. -Late adulthood: > 50 years.

Racial Factors: -Variable incidence rates are noted among different countries.

-Scandinavian countries show the highest incidence while Japan shows the lowest incidence.

Laterality and Bilaterality:

-Testicular neoplasms are slightly more common on the right testis, similar to cryptorchidism.

-Approximately 2% to 3% of testicular tumors are bilateral.

Histologic types

-Germinal tumors constitute between 90% and 95% of all primary testicular malignancies.

-Seminoma: 30% -Embryonal carcinoma: 2-3% -Teratoma: 5% to 10%

-Pure choriocarcinoma: 1% -Mixed tumors in 60%.

Risk factors:

A) Congenital:

Cryptorchidism: (Absence of one or both testes from the scrotum)

-Tumors have 8 times higher incidence in cryptorchidism.

-Factors that may play a causative role are:

-Abnormal germ cell morphology -Elevated temperature -Endocrine dysfunction.

***Orchiopexy does not prevent carcinogenesis, but rather allows clinical surveillance.**

-The more the level of undescended testes, the more the incidence of malignancy:

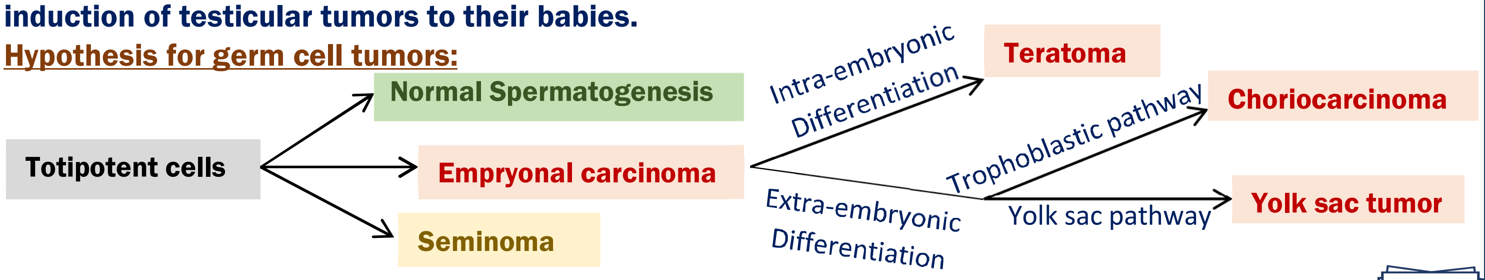
-Intraabdominal: 1/20 -Inguinal: 1/80

B) Acquired:

1-Trauma: Although trauma is considered a contributing factor, Most investigators conclude that trauma to the enlarged testis is an event that prompts medical evaluation rather than a causative factor.

2-Hormones: Exogenous estrogen administration to the pregnant women has been linked to the induction of testicular tumors to their babies.

Hypothesis for germ cell tumors:



Pathology of testicular tumors:

1) Seminoma:

Gross picture: Diffuse symmetrical enlargement

Cut section: The testis is replaced by pink homogenous Mass, no hemorrhage or necrosis

Microscopic picture:

Large sheets of cells with clear cytoplasm and densely staining nuclei.

-Classic type(85%) - Anaplstic(5-10%) -Spermatocytic (>50-year age) (5-10%)

2) Empryonal cell carcioma:

Types: -Adult type - Infantile type (yolk sac tumor)

Gross picture: Asymmetrical non homogenous enlargement

Cut section: The testis is replaced by irregular grayish white mass, with areas of hemorrhage and necrosis

Microscopic picture:

Malignant epithelioid cells arranged in glands or tubules. The cytoplasm is vacuolated, and the nuclei rounded with coarse chromatin and one or more large nucleoli.

3) Teratoma:

Gross picture: Loboulated with variable consistency (solid and cystic)

Cut section:

The cut surface may reveal variably sized cysts containing gelatinous, mucinous, or hyalinized material interspersed with islands of solid tissue often containing cartilage or bone

Microscopic picture:

The cysts may be lined by squamous, cuboidal, columnar, or transitional epithelium, and the solid component may contain any combination of cartilage; bone; intestinal, pancreatic, or liver tissue; smooth or skeletal muscle. Immature teratoma: Undifferentiated tissue→ High malignancy

4) Choriocarcinoma:

Gross picture: Small palpable nodule.

Cut section: Central hemorrhage with grayish white tumor at the periphery.

Microscopic picture:

Syncytiotrophoblasts and cytotrophoblasts. The syncytiotrophoblasts may be large, multinucleated cells containing abundant, often vacuolated, eosinophilic cytoplasm. The cytotrophoblasts are intermediate-sized, uniform cells with a distinct cell border, clear cytoplasm, and a single vesicular nucleus.

-Early hematogenous spread.

Patterns of Spread of Germ Cell Tumors

Direct spread: Epididymis, spermatic cord and scrotal skin

Lymphatic spread:

From T1 to L4. Testis cancer spreads in a predictable and stepwise fashion Right-sided tumors spread to be interaortocaval, precaval, paracaval and for left-sided tumors to be left para-aortic and preaortic nodes. There is some crossover, especially from right to left. Then to the common & external iliac L.N.

Blood spread: Early in choriocarcinoma

Clinical Manifestation:

Symptoms:

-The usual presentation of a testicular tumor is **a nodule or painless swelling** of one gonad that may be noted incidentally by the patient.

-10% of patients, **acute pain** is the presenting symptom due to intra-testicular bleeding.

-10% of patients, the presenting manifestations may be due to metastases.

- **Back pain:** RPLN involving nerve roots.
- **Dyspnea & cough:** pulmonary m.
- **Bone pain:** Bone m.
- **Swelling of LL:** obstruction of IVC.

-**Gynecomastia** seen in about 5% of patients with testicular GCTs, may be regarded as a systemic endocrine manifestation.

Physical Examination:

General examination: Gynecomastia, LT supraclavicular L.N (Virchows).

Abdominal examination: Retoperitoneal L.N. enlargement

Local examination

-The normal testis is homogeneous in consistency, freely movable, and separable from the epididymis.

-Any firm, hard area should be considered suspicious until proved otherwise.

-Seminoma presents as a painless, rubbery enlargement.

-Embryonal carcinoma produces large irregular mass. -Small secondary hydrocele may be present.

Investigations:

A) Laboratory (tumor markers):

Germinal testis tumors produce marker proteins that are relatively specific and readily measurable using radioimmunoassay

Alpha-Fetoprotein (AFT): is elevated in non-seminemotus germ cell tumors (NSGCT)

Human chorionic gonadotropin (hCG): ↑ in choriocarcinoma & other NSGCT & in 15% of seminoma.

Lactic Acid Dehydrogenase (LDH): is elevated in bulky tumors

Importance of tumor markers: -Diagnostic -Prognostic -Monitoring therapy response

B) Imaging studies:

1- Scrotal Ultrasound: It is a rapid, reliable technique to exclude hydrocele or epididymitis and should be used if there is any suspicion of testicular tumor.

2- Chest X-Ray Study: Should be the initial radiographic procedures performed providing the minimal assessment of the lung parenchyma and mediastinal structures.

3- Computed Tomography: The most effective means to identify retroperitoneal lymph node involvement.

4- Magnetic Resonance Imaging: Similar to C.T **5- Pedal Lymphangiography (LAG)**

6- Inguinal orchiectomy: Therapeutic & Diagnostic

Staging of testicular tumors:

Stage I: Tumors limited to the testis

Stage II: **A:** Retroperitoneal L.N < 2 cm **B:** Retroperitoneal L.N >2 cm

Stage III: Supra-diaphragmatic nodal involvement or visceral

Clinical staging (TNM):

T-primary tumor

T1: limited to testis or epididymis T2: invades beyond tunica albuginia

T3: invades spermatic cord T4: invades scrotum

N-Regional L.N

N0: No regional L.N N1: L.N. enlargement < 2 cm

N2: L.N. enlargement (2-5 cm) N3: L.N. enlargement > 5 cm

M-Distant metastasis

M0: no distant metastasis M1: Distant metastasis

Differential diagnosis: -Syphilitic gumma -Old clotted hematocele -Epididymo-orchitis -Hydrocele

Treatment of testicular tumors:

1-Inguinal Exploration (Chevasu maneuver):

-Inguinal exploration with application of vascular clamps to the spermatic cord is the main stay of exploration of suspected testicular tumors -Scrotal approach should be avoided as it allows spread of tumors.

2-Further treatment:

a- Seminoma: Low-stage seminoma (I, II-A) → Low dose retroperitoneal irradiation 2500-3000 cGy is used
High-stage seminoma (II-B, III) → chemotherapy (Cisplatinum based rejimens)

b- Non-seminomatous:

- Low-stage → Retroperitoneal Lymph Node Dissection is the treatment of choice
  *Modified RPLND: Only ipsilateral groups of LNs
- High-stage → Cisplatinum based Chemotherapy